PHYSICS

BOOKS - BETTER CHOICE PUBLICATION

FORCE ON A CURRENT

Very Short Answer Type Questions

1. State Fleming's left hand rule.

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2. Find the force acting on a current carrying conductor placed in an uniform magnetic field.

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3. State the principle of moving coil galvanometer?

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4. What is shunt? State its S.I.units.

5. What is shunt? State its S.I.units.

6. Is the resistance of an ammeter greater than or less than that of the galvanometer of which it is formed?

7. Why are poles of field magnet of moving coil galvanometer made concave inshape?

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8. How can a galvanometer be converted into an ammeter?

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Very Short Answer Type Questions Most Expected Questions

1. Define an ampere in terms of the force between current carrying conductors.

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2. What is the nature of magnetic field in a moving coil galvanometer?

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3. What isi the resistance of an ideal voltmeter and an ammeter?

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4. State two properties of the material of the wire used for suspension of the coil in a moving coil galvanometer?

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5. What do you mean by radial magnetic field ?

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Short Answer Type Questions

1. What is the difference between a voltmeter and an ammeter?

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2. What do you mean by current sensitivity of a galvanometer and how it can be increased ?

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3. To convert galvanometer into a voltmeter.

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4. How can a galvanometer be converted into an ammeter?

5. Write general expression for force between two point charges.

6. WHat is the direction of force between two parallel conductors carrying current in opposite direction?

7. Derive an expression for torque acting on a bar magnet placed in a uniform magnetic field.

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8. The direction of force experienced by a current carrying conductor placed in a magnetic field is given by

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9. Find the force acting on a current carrying conductor placed in an uniform magnetic field.

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10. Explain how a Galvanometer can be converted into Voltmeter.

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11. What is an ammeter ?

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12. Find the force acting on a current carrying conductor placed in an uniform magnetic field.

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1. What is a safety fuse? Explain its function.

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2. A galvanometer gives full scale deflection with the current I_g. Can it be converted into an ammeter of range $I < I_g$?

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3. Why earth's magnetic field does not affect the working of the moving coil galvanometer?

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4. Why should an ammeter have a low resistance?

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5. How will you convert galvanometer into an ammeter? Why is an ammeter always connected in series?

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Long Answer Type Questions

1. State the principle of moving coil galvanometer?

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2. State the principle, construction and working of a moving coil galvanometer with the help of diagram. Write the factors on which its current senstivity depends?

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3. Explain the construction, working and theory of dead beat galavanometer with the help of a suitable diagram.

4. State the principle, construction and working of a moving coil galvanometer with the help of diagram. Write the factors on which its current senstivity depends?

5. With the help of diagram explain the principle, construction and theory of a moving coil galvanometer. What is the function of iron core in moving coil galvanometer?

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6. Find the force acting on a current carrying conductor placed in an uniform magnetic field.

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7. When is the force experienced by a current carrying conductor placed in a magnetic field, the largest?

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8. Derive an expression for the torque acting on a rectangular current carrying loop suspended in a uniform magnetic field.

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9. Derive an expression for the torque acting on a rectangular current carrying loop suspended in a uniform magnetic field.

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10. What do you mean by current sensitivity of a moving coil galvanometer? On what factors does it depend?

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11. Explain how a Galvanometer can be converted into Voltmeter.

12. Explain how a Galvanometer can be converted into Voltmeter.

13. Explain how a Galvanometer can be converted into Voltmeter.

14. Derive the expression for the torque acting on a current carrying loop placed in a magnetic field.

15. With the help of labelled diagram, give the principle, construction and theory of cylotron.

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Numerical Problems

1. A currentof 5.0 A is flowing in eah of the two parallel conductors of infinite length separated by certain distance apart in vacuum in the same directions. Each conductor

expereinces a force of $2 \times 10^{-4} Nm^{-1}$ due to the other. Find the separation between the two conductors.

2. A short conductor of length 5.0cm is placed parallel to a long conductor of length 1.5cm near its centre. The conductors carry currents 4.0A and 3.0A respectively in the same direction. What is the total force experienced

by the long conductor, when they are 3.0cm apart?

3. Two infinite long straight parallel wires A and B carry current of 4 A and 10 A respectively in opposite direction and are placed at 10 cm apart in vaccum. Find the force on 15 cm length of wire B.
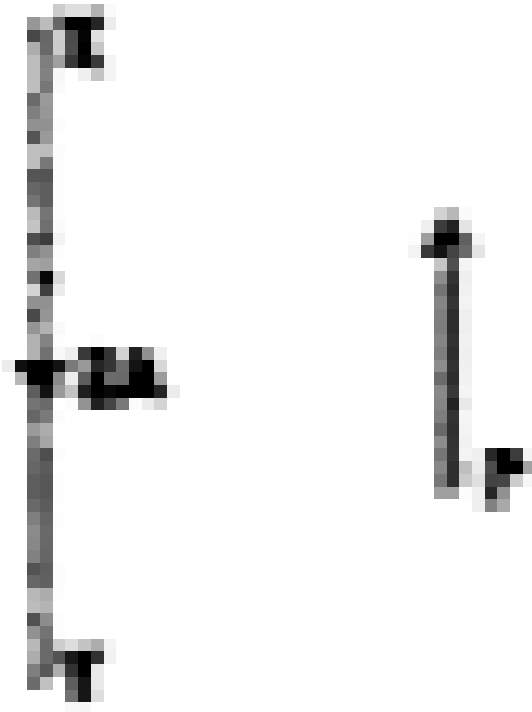
4. A long straight wire XY carries a current of 2 amperes. A proton P travels at $5 \times 10^{-6} ms^{-1}$ parallel to the wire as shown in the diagram, $0 \cdot 2$ m away from it. Find out the magnitude and direction of force which magnetic field

exerts on the proton.

5. A galvanometer has a resistance of 50 ohm. A resistance of 5 ohm is connected across its terminals . What part of total current will flow thorugh the galvanometer?

6. In a galvanometer there is a deflection of 10 divisions per mA. The internal resistance of the galvanometer is 60 Ω. If a shunt of $2 \cdot 5\Omega$ is connected to the galvanometer, calculate the

maximum current in which the galvanometer can be dead.

7. A galvanometer coil has a resistance of 15Ω and the metre shows full scale deflection for a current of 4mA. How will you convert the metre into an ammmeter of range 0 to 6 A?

8. A voltemeter reads up to 3 V. It resistance is 200 ohm. It is to be used to measure a potential difference, which may be as large as 60 V. What measures you would take to protect the voltmeter?

9. It is desried to pass only 5% the current through a galvanometer of resitance 95 ohm.

What shunt resistance should be connected across it?

10. A resistance of 90 Ω is connected in series with a galvanometer of resistance 100 Ω A potential difference of 1 V produces a deflection of 100 divisions in the galvanometer. Find the figure of merit galvanometer.